भारतीय मानक
Indian Standard

IS 17532 : 2021

एटीएम तिजौरी — विशिष्टि

ATM Safes — Specification

ICS 13.310

© BIS 2021

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुरशाह ज़फर मार्ग, नई दिल्ली – 110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI-110002
www.bis.gov.in www.standardsbis.in

March 2021 **Price Group 6**

Security Equipments Sectional Committee, MED 24

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Security Equipments Sectional Committee had been approved by the Mechanical Engineering Divisional Council.

Over the last decade, ATMs have witnessed phenomenal growth in India. The burglary attempts on ATMs have also increased over the years. The present scenario demands that the security level of ATMs be enhanced and effectively ensured to provide necessary assurance to the consumers.

The availability of an Indian standard on one of the most important components of an ATM system, namely ATM safes, is a primary requirement towards addressing the problem.

Considerable technical assistance has been derived from the first ever standard on ATM safes in India, EMTAC – P-101: 2016, published by EMTAC Laboratories Pvt Ltd, who offered the standard to be used as a working draft for preparing the Indian Standard Specification.

The unique features of this standard are:

a) Higher burglary resistance has been prescribed for the ATM safe door in view of its easier accessibility for an attack.

b) Uniform performance parameters have been prescribed for different types of construction.

c) The standard is implementable irrespective of the type and material of construction.

d) A minimum resistance requirement has been prescribed for attempts to severe the safe from its anchorage.

Considerable assistance has been derived from EN 1143-1 in preparing this specification. The performance requirements specified herein have been inspired by the provisions of EN 1143-1. In appreciation of the method of burglary resistance evaluation specified in EN, the tools and the evaluation procedure have been retained with minimum changes.

The composition of the Committee responsible for the formulation of this standard is given in Annex D.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding off numerical values (*revised*).’ The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

ATM SAFES — SPECIFICATION

1 SCOPE

This standard specifies the physical construction, general requirements and performance criteria for ATM safes.

2 TERMINOLOGY

2.1 ATM (Automatic Teller Machine) — A machine for storing and disbursing cash automatically on authentication through a smart card. The machine may also perform other banking operations related to the banking account authenticated similarly.

NOTE — For the purpose of this standard, automated teller machines, currency exchange machines, currency recycling machines and machines such as teller assist machine etc. are all considered as ATM.

2.2 ATM Base — Any integral part of an ATM system located between the ATM safe and the surface to which the safe is to be anchored.

2.3 ATM Unit — ATM physical system consisting of ATM safe, cash disbursal system and external casing.

2.4 ATM Safe — Safe forming part of an ATM system.

2.5 ATM System — Assembly of sub units which provides an ATM function and affords security to cash and/or valuables stored within the ATM safe.

2.6 Basic Value (BV) — Number of resistance units allocated to particular tool.

NOTE — The basic value represents problems in obtaining, transporting, using and operating the relevant tool at the site in question and necessary knowledge and experience for its efficient use.

2.7 Internal Space — Part of the interior of an ATM safe which is bounded by the inside surfaces and the bolt-work cover plate(s) of the door of the ATM safe body.

2.8 Net Working Time (NWT) — NWT is the period during which a tool is used to attempt to create changes in the test specimen. It is to be exclusive of preparation time for test and time required for safety precautions, changing tools and its accessories and/or any other administrative requirement or break. Time shall be measured with granularity of 1 s.

2.9 Opening — A through circular opening of 125 mm diameter or a rectangular opening of 125 × 100 mm or a square opening of 112 × 112 mm made in the body of the ATM safe.

2.10 Resistance Grade — A classification designation of the ATM safe as determined by its resistance value.

2.11 Resistance Unit (RU) — A numerical expression of burglary resistance resulting from one minute's use of a tool having a tool coefficient of 1 and a basic value of zero.

2.12 Resistance Value — Numerical value in resistance unit calculated for each test.

2.13 Size — The size of an ATM is denoted by its external height.

2.14 Tool Coefficient — Number in resistance units per minute allocated to a group of tools.

NOTE — The tool coefficient represents factors such as noise, smoke, fumes and other effects, which increase the likelihood of a burglary attack being detected.

3 CLASSIFICATION

3.1 ATM safes shall be classified according to the grades specified in Table 1.

4 DESIGNATIONS

An ATM safe shall be designated by its grade and size.

Example: An ATM safe of Grade B, Size – 600 mm shall be designated as ATM-B – 600.

5 MATERIALS FOR ATM SAFES

Materials specified in Table 2 are for general guidance only. Please refer to Annex C. The critical quality parameters of the materials used for the components shall be declared by the manufacturer at the time of type approval and records.

a) Any metal plate or rod used in construction of ATM safe shall have a minimum tensile strength of 270 MPa.

b) Any other material may be used provided the construction meets the performance requirement of the relevant grade specified in this standard.

Table 1 Classification of ATM Safes

(*Clauses* 3, 7.2, 7.4, 9.2 *and* 11)

Resistance Grade	**Minimum Resistance value** (V_R) (Refer Annex A)				**Anchoring Strength** (*Clause* 9)	**Locks** (*Clause* 8)
	Through opening made without using existing apertures	Through opening made using existing apertures	Opening of ATM safe door	Tool attack test on fixing attachment (Before anchoring)	Required force (kN)	Quantity (minimum)
(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)
A	30	30	60	30	50	1
B	70	60	110	55	70	1
C	120	100	180	55	100	1*
D	270	220	400	75	100	1*

* NOTE — Provision shall be made for fitment of second lock.

Table 2 Materials for ATM Safes

(*Clause* 5)

Sl No.	**Part**	**Material**
(1)	(2)	(3)
i)	Outer body, inner body, back, door, hinge, bolt work, internal fixtures, etc	Any grade of stainless steel or any other non-ferrous metal/alloy or mild steel having minimum tensile strength of 270 MPa [*see* IS 277, IS 513 (Part 1), IS 513 (Part 2), IS 1079, IS 2062, IS 1875, IS 5986, IS 5522, IS 6911 and IS 6603 etc.]
ii)	Handles and other fittings	Cast brass or tin bronze or mild steel powder coated or stainless steel or ABS or any other material suitable for the purpose

6 DIMENSIONS AND OTHER REQUIREMENTS OF ATM SAFE

6.1 Dimensions

ATM safes of any dimensions may be manufactured, as agreed between manufacturer and purchaser, subject to a tolerance of +/−3 mm on each declared dimension.

6.2 Size

Size of the ATM safe shall be denoted by its external height.

6.3 Weight

a) Minimum weight of the ATM safe shall be 200 kg. At the time of type approval or revalidation or testing for any other purpose, the manufacturer shall declare the nominal weight of the ATM safe. The observed value shall be within +10/−5 percent of the declared nominal value.

b) The nominal weight of the ATM shall be declared by the manufacturer at the time of certification. The actual weight of the ATM safe at the time of supply shall be within +10/−5 percent of the declared weight.

7 CONSTRUCTION AND WORKMANSHIP

7.1 Body

The construction of body shall be such that the resultant force of pull on the handle/door is resisted by a member that is either an integral part of the body or is welded to the inner part of the body and not by any component part that is screwed or riveted.

It shall not be possible to open the ATM door, in bolt engaged condition, within the minimum required amount of RU specified for the corresponding grade.

7.2 Anchoring Arrangement

Minimum four anchors shall be provided, preferably, on the bottom of the ATM safe. The anchoring strength shall meet the requirement specified in Table 1.

7.3 Cable Entry Openings

Cable entry opening, if required by the purchaser, shall be suitably provided. Size of the cable openings shall be clearly indicated in the drawing. Cable entries may be used for burglary resistance tests.

7.4 Opening for Currency Dispense or Deposit

At least one suitable opening for currency dispense or deposit shall be provided on the ATM safe. The dimensions of the opening shall be declared.

If two or more currency handling openings are close together, the tester is allowed to combine these in the test to create the through opening.

Unused openings should be blocked. In case of a test attack on the unused currency disbursal opening, it should meet the requirement of minimum resistance value specified at col (ii) of Table 1 for the respective grade. At the time of supply of the ATM, any currency disbursal opening, that is not intended to be used, shall be blocked with the same arrangement that has been used for testing of the ATM safe.

7.5 Door

Door shall be made of mild steel plates, backed with suitable barrier(s) or any other type to meet the performance requirements as per the grade.

Door shall fit snugly. In the close position, the gap at any place between the door and body shall not be more than 1 mm.

In locked position, the door shall not have a play of more than 1.5 mm in the direction in which it opens.

7.5.1 The door shall be secured by the movement of bolt work by using suitable handle and mechanism shall be allowed or disallowed to operate with the help of lock.

7.5.2 *Automatic Relocking Device*

An automatic relocking device one for each lock shall be fitted in the door which being always on guard, shall come into operation if a lock is dislodged by explosives or other means.

7.5.3 Door shall have an internal bolt work cover plate which prevents unauthorized viewing of locks and bolt work and access to them, when the door is open. Bolt work cover plate shall be secured so that they cannot be opened or removed by unauthorized person without leaving visible traces.

8 LOCKS

High security locks conforming to relevant class of EN 1300 or equivalent as given below, shall be used on ATM safes.

Grade of ATM Safe	**Minimum class of lock in EN 1300**
A	A
B	B
C	B
D	C

NOTE — At present there is no suitable Indian Standard for High Security locks to be used with ATM safes. As and when a standard is published, the requirement of locks shall be suitably modified.

Where the ATM safes are supplied without locks, the appropriate grade/Class of lock shall be supplied with safe for testing.

9 ANCHORING STRENGTH TEST

9.1 Principle

A horizontal force is applied on the ATM safe with an aim to fully or partially dislodge it from its anchored position.

9.2 Test Equipment

a) An arrangement to apply a horizontal force, as specified in Table 1, on the test specimen within an accuracy of ± 5 percent.
b) Steel plate to which the ATM safe shall be anchored. The plate shall be capable of withstanding the applied force, as specified in Table 1.
c) Suitable devices for measuring the distance of movement or angle of tilt of ATM safe on completion of test.

9.3 Test Criteria

Application of horizontal force for 1 min shall not cause the ATM safe to be moved by more than 200 mm or to be tilted through an angle of more than 60°.

9.4 Test Condition

9.4.1 The ATM safe shall be anchored according to the manufacturer’s recommendation. An ATM safe without base shall be fixed directly to the steel plate. For an ATM safe with base, the safe shall be first attached to the base and the base in turn shall be attached to the steel plate. In either case manufacturer’s recommendation shall be followed.

9.4.2 Wall mounted ATM safes shall be turned through 90° and attached to the steel plate simulating the vertical mounting wall.

9.4.3 Used bolts and other fixing arrangement shall not be used for anchoring the ATM safe.

9.4.4 An attachment may be fixed to the ATM safe to facilitate the application of the force. It shall be ensured that the attachment does not weaken the ATM safe or tamper with its construction in any manner.

9.5 Test Procedure

a) Test shall be carried out with the ATM safe in closed and locked position. The location of the sides of the ATM shall be marked to facilitate measurement after the test.

b) For floor-mounted ATM safes, the force shall be applied (100^{+10}_{-0}) mm below the top of the ATM safe. For wall mounted ATM safes the force shall be applied (100^{+10}_{-0}) mm below the highest point of the safe when mounted according to **9.4**.

c) The load shall be applied smoothly and the required force shall be attained within 2 to 3 minutes. The force shall be maintained for 1 minute. The time shall be taken by a stop-watch after which the angle through which the ATM safe is tilted shall be measured while the applied force is maintained.

d) After the applied force has been released, the result of the application of force shall be measured. Where the ATM has been completely dislodged, the distance between the front face of the ATM before and after test shall be measured. In case of partial displacement, the angle shall be measured at the point of maximum displacement.

10 SURFACE FINISH

10.1 The inside and outside surfaces of the safe shall be painted or powder coated. In case of paint, an appropriate primer and undercoating shall be used in accordance to industry practices. The minimum overall thickness of the coatings shall be 50 μ for powder coating and 70 μ for liquid paints. Cross hatch test shall be conducted as per **10.2** to access the adhesion of the coating.

10.1.1 The requirement of surface finish is not applicable to surfaces like stainless steel or any other corrosion resistant material.

10.2 Cross Hatch Test

a) Make 6 parallel cut marks using sharp metal pointer and straight edge, through the painted/coated surface, so as to make the base surface visible through cut marks.

b) Cut marks shall be minimum 20 mm long and at 2 mm distance from each other.

c) Make 6 similar cut marks in the direction perpendicular to first set of cut marks, with same length and spacing.

d) These 12 cut marks together shall make a pattern of 25 squares of 2 mm × 2 mm size, totally separated from each other.

e) A good quality transparent adhesive tape not less than 20 mm width shall be stuck on the pattern, parallel to any one set of cut marks.

f) To ensure continuous contact with paint/coat film, rub the tape firmly and remove air bubbles under the tape, if any.

g) Within 60 to 120 seconds after sticking the tape, remove it by seizing free end of the tape and rapidly pulling it off at an angle close to 180º.

h) Painting/Coating quality is considered as acceptable, if none of the 2 mm × 2 mm squares of paint/coat comes off the surface due to pulling the tape.

11 BURGLARY RESISTANCE

11.1 The burglary resistance performance (in terms of RU) of an ATM safe shall meet the requirement specified in Table 1 for the applicable grade.

11.2 The burglary resistance shall be determined by the method prescribed in Annex A.

11.3 For the purpose of evaluation of burglary resistance, the ATM safe shall at least, be subjected to the following attacks:

a) an attack for opening the door;

b) an attack on the back;

c) an attack on the top;

d) an attack on any one side face of the Safe at the discretion of the testing team; and

e) any other attack leading to an access as specified in this standard.

11.4 ATM safes shall be graded on basis of the minimum resistance value (VR) achieved.

11.5 ATM safes shall be graded on basis of the minimum resistance value (V_R) achieved.

12 MARKING

12.1 Marking of ATM Safes

A metal plate displaying the following information shall be fixed on the inner face of the door shutter of ATM safes.

a) Designation of the ATM safe;

b) Manufacturer’s name;

c) Manufacturer’s Trade-Mark (If any);

d) Serial Number of the ATM safe;

e) Year of manufacturing;

f) Batch number (If any); and

g) The declared nominal weight of the ATM safe.

NOTE — For the sake of convenience in marking, the manufacturer may devise a codified system combining some or all of the information specified in (a) to (g), provided all information can be effectively traced back.

12.2 Marking on Keys

In case of key Locks fitted if any, the keys shall bear an identification number.

12.3 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the product(s) may be marked with the Standard Mark.

13 TESTS AND CRITERIA FOR CONFORMITY

13.1 The ATM safes shall be considered to be conforming to the requirements of this standard, if they successfully passes the requirements and tests for any grade as specified in **5** to **11** of this standard.

13.2 The manufacturer shall declare the grade prior to testing and the conformance shall be decided accordingly.

14 TECHNICAL DOCUMENTATION AND DESIGN DEFINITION

14.1 The manufacturer shall provide a detailed engineering drawing of the test specimen, along with the sample offered for testing, indicating the following:

a) A statement of the product designation as per ATM standard;
b) Declared nominal weight of the sample;
c) Inside dimensions and wall thickness with manufacturing tolerances;
d) Horizontal and vertical cross-sections of individual layers constituting the barrier;
e) Information about any materials or devices intended to generate gas, smoke or any other substance which may cause harm or injury to the test team members during testing;
f) A list of the sizes covered by the same design shall also be indicated by their designations, in the event of samples being submitted for type approval or revalidation by a certifying authority; and
g) Detailed instruction for anchoring the safe.

14.2 The documentation on basis of which type approval or revalidation is obtained, shall be authenticated by the certifying authority and the testing agency. Copies of the authenticated document shall be retained by the certifying organization and the manufacturer and shall be the reference point for future validations or disputes.

14.3 Any deviation from the approved technical documentation, beyond the tolerances permitted in this standard, shall constitute a design change and shall necessitate a revalidation of the design.

15 RECORDING AND REPORTING OF TEST RESULTS

15.1 The test report shall include the following:

a) Identification of test specimen;
b) Date(s) and place of testing;
c) Composition of testing team indicating the roles of the members;
d) Description of each tool attack in chronological order of events giving details of point of attack, tools used and time measurements;
e) Continuous video recording of the attacks;
f) Photographs of test sample taken before and after each attack;
g) List of tools used with details of critical technical specifications; and
h) Report on all requirements of the specification, with values wherever applicable.

15.2 The burglary resistance test results shall be reported in terms of the resistance value along with details of calculations.

ANNEX A

(*Clauses* 3 *and* 11.2)

BURGLARY RESISTANCE TEST

A-1 PRINCIPLE OF TESTING

A-1.1 The test is intended to simulate an actual attack situation with the use of tools that are most likely to be used by a team of burglars. The aim of the attack is to establish the resistance offered by the safe while attempting to make a through opening of one of the specified test gauges by use of specified tools. The resistance is assessed in terms of resistance value as determined by the tools and the time period of their use.

NOTE — The opening shall be big enough to just allow the passage of the appropriate test gauge.

A-1.2 The tools and programme of attack used during testing shall be those most likely, in the opinion of the testing team, to result in the lowest resistance values.

A-2 EXPLORATORY TESTS

A-2.1 Exploratory test may be done on the test specimen subject to the following conditions:

a) These should be done before starting the actual test. Any exploratory test done after start of the test will be included in the networking time.

b) The exploratory tests should be done preferably on a surface which will not be subjected to the actual test.

A-3 TEST GAUGE

A-3.1 One of the three following gauges, appropriate to the attack, shall be chosen for the test:

a) A cylindrical test block of length 150 mm minimum and diameter $125 \pm {}^{3}_{0}$ mm;

b) A 112 mm × 112 mm ± 0.2 mm square test block of length 150 mm; and

c) A 125 mm × 100 mm ± 0.2 mm rectangular test block of length 150 mm.

A-3.2 Test gauges shall be made of hardened materials.

A-4 TEST CRITERIA

A-4.1 The criteria for a successfully completed tool attack test are:

a) *For any Face* — The test gauge shall completely pass through the opening created.

b) *For Door* — For a door attack as per col (iv) of Table 1, the ATM safe door shall be opened by at least 70 percent of the internal width of ATM safe over at least 70 percent of the height of the door. For a through opening on the door, the RU requirement shall be same as any other face.

c) For Fixing Attachments — The fixing attachments shall be completely severed.

A-4.2 Any tool attack test shall be continued until no more information necessary for determining the resistance grade can be reasonably expected. This can occur when the resistance value discovered in previous test attack is exceeded.

A-4.3 An abandoned tool attack test shall count as one of the tests required.

A-5 TESTING TEAM

A testing team shall consist of:

a) A team leader familiar with design practices followed in the industry.

b) A time keeper familiar with the concept of net working time and the use of a stop-watch.

c) Two operators skilled in operation of specified tools and trained in carrying out burglary resistance test.

NOTES

1 The team leader and time-keeper shall not participate in the operation of tools during the attack.

2 No member of the team, except the time keeper, shall be changed/replaced during an attack.

A-6 TESTING CONDITIONS

a) Prior to performing the actual test attack, exploratory tool attacks can be carried out. These attacks shall not affect the number of actual test attacks required.

b) Non-destructive lock manipulation or lock picking attacks are not allowed.

c) ATM safes shall be tested with tools categorized in Annex B.

d) During tool attack test following tools shall not be used simultaneously:

   1) two electric powered tools (*see* Table B-7, B-8, B-9 and B-10);
   2) two thermal tools (*see* Table B-11);
   3) two hand hammering tools (I Table B-5);
   4) electric powered tool and a thermal tool;
   5) hand hammering tool and an electric powered tool;
   6) hand hammering tool and a thermal tool; and
   7) two specially made electric powered tools (*see* Table B-6).

e) Dust cleaners brush may be used for cleaning the test specimen.

f) Testing shall only be done in areas or against features which have not been weakened by earlier test specimen.

g) All the attacks on ATM safe shall be completed within 48 hours, including all breaks taken by the testing team.

h) No mechanical advantage shall be derived from an artificial condition for the test specimen.

j) The use of balancers is not allowed in a tool attack test.

k) Testing shall not be done in areas or against features which have been weakened by earlier tests.

A-7 TEST PROCEDURE

a) The team shall study the ATM safe along with the documentation provided by the manufacturer and accordingly prepare a test plan and document the same with reasons.

b) The location of the intended area of attack shall be marked on the surface on which the attack is planned.

c) The team leader shall ensure that the operators use the appropriate tools that are likely to have maximum destructive impact on the object of attack.

d) While selecting the attack tools the team leader shall give due consideration to the ultimate aim of attaining the lowest resistance value while creating the desired opening.

e) The team leader shall take all steps to ensure that the operators do not over-exert leading to a weak attack. Such steps may include rotation of operators etc.

A-8 MEASUREMENT OF NET WORKING TIME

A-8.1 For each attack operation the clock shall be started when the tool is touching and attempting to make changes in specimen and shall be stopped when tool ceases to touch the test specimen.

A-8.2 In case of using hammer, each blow shall be counted as 1 s when hammer is used with one hand only (1.5 kg, max). For sledge hammers where both hands are to be used (more than 1.5 kg to 3.5 kg max.) each blow shall be counted as 2 s. The time period required to carry out the hammer attack shall not be counted in NWT.

A-8.3 The following shall be included in NWT:

a) The time period for which a tool is in contact with the surface of attack.

b) Any time period, not exceeding 3 s, taken to reposition a tool on the attack surface either by the attacker or another member of the attack team.

A-8.4 The following shall not be included in the NWT:

a) Time taken for exploratory tests not intended to weaken or damage the object of attack.

b) Period of rest taken by the attack team members in between the periods that constitute the networking time.

c) Time taken to change or repair an attack tool or any of its components (Re-sharpening of any attack tool during an attack is not permitted).

d) Time taken to clean the surface by using a metal brush, cloth or similar accessories.

A-9 CALCULATION OF RESISTANCE VALUE (V_R)

For each tool attack, calculate the resistance value V_R from the following equation,

$$V_R = (\sum t \text{ x } c) + \sum BV$$

where

$\sum t$ = The sum of all operating times in minutes;

c = The highest tool coefficient of the used attack tools; and

$\sum BV$ = The sum of the basic values for all attack tools used.

The calculated value shall be rounded up to the next whole number and represent the resistance value in resistance units (RU) for that tool attack test.

ANNEX B

TEST EQUIPMENT LIST

(*Clause* A-6)

In this table tool coefficients and basic value are given for each tool and tool category (A, B, C) which are allowed to be used in the burglary attack. The intended use of the tools are also described.

NOTE

1 In some cases, the Basic value also may vary within a tool category.

2 The tool specifications given are nominal. Actual specifications within a variation of ± 10 percent is acceptable.

3 The tools that can be used are not restricted to the examples given in the Tables. Any other tools may be used provided they match the description and the corresponding technical specification.

Table B-1 Hand Dis-assembling Tools

(BV = Basic Value in RU)

A	B	C
Tool coefficient 5 RU/min	Tool coefficient 7.5 RU/min	Tool coefficient 10 RU/min
Weight 1.5 kg and length 400 mm	Weight 3.5 kg and length 1500 mm	–
BV = 0	BV = 5	

These tools are used for non-destructive assembling of detachable elements, e.g. to detach screws, pins or bolts, sprig clips.

Examples: Screw drivers, fork/ring/adjustable wrenches etc.

Table B-2 Hand Gripping Tools

(BV = Basic Value in RU)

A	B	C
Tool coefficient 5 RU/min	Tool coefficient 7.5 RU/min	Tool coefficient 10 RU/min
Length 400 mm	Length 1500 mm	–
BV = 0	BV = 7	

These tools are used for the gripping (lever transmission) of tools and materials, for example, fixing/holding of chisel.

Examples: Fork/ring/adjustable wrenches, chisel holders, forged tong, universal pliers etc.

Table B-3 Hand Levering Tools

(BV = Basic Value in RU)

A	B	C
Tool coefficient 5 RU/min	Tool coefficient 7.5 RU/min	Tool coefficient 10 RU/min
Length 750 mm	Length 1500 mm	–
BV = 5	BV = 7	

These tools transmit physical force as a lever, for example, prise-up a door, deform or fracture weak pieces.

Examples: Screw drivers, tyre leavers, hand levers, crow bars etc.

Table B-4 Manual Hand Sawing/Filing/Cutting and Drilling Tools

(BV = Basic Value in RU)

A	B	C
Tool coefficient 5 RU/min	Tool coefficient 7.5 RU/min	Tool coefficient 10 RU/min
Weight 1.5 kg and length 400 mm	–	–
BV = 3		

These tools are used for manual grinding, cutting and detaching of various components/materials without electrical power.

Examples: Hand drills, saws, files, side cutters, bolt croppers/cutters, plate shears, steel cutters etc.

Table B-5 Hand Hammering Tools

(BV = Basic Value in RU)

A	B	C
Tool coefficient 5 RU/min	Tool coefficient 7.5 RU/min	Tool coefficient 10 RU/min
Head weight 1.5 kg and length 750 mm	Head weight 3.5 kg and length 1000 mm	–
BV = 5	BV = 7	

These tools are used to break up various materials and to propel different accessories, such as chisels, drift punches and wedges.

Examples: Sledge hammer, club hammer, hand axes, pick axes etc.

Table B-6 Specially Made Tools

(BV = Basic Value in RU)

A	B	C
Tool coefficient 5 RU/min	Tool coefficient 7.5 RU/min	Tool coefficient 10 RU/min
Power consumption 500 W, weight 1.5 kg and length 400 mm	Power consumption 800 W, weight 3.0 kg and length 750 mm	–
BV = 18	BV = 28	

These tools are usually not commercially available but are conceived or provided especially for certain purposes at the test.

Table B-7 Electric Powered Tools, without Impact

(BV = Basic Value in RU)

A	B	C
Tool coefficient 5 RU/min	Tool coefficient 7.5 RU/min	Tool coefficient 10 RU/min
Weight 3.0 kg and Power consumption 550 W	Power consumption 800 W	Power consumption 1350 W BV = 25 Plus an addition for a drilling-rig
BV = 7	BV = 11	BV = 11

These are electrical tools used to drill or cut without impact option.

Examples: Electric drill machine, jig saw, sabre saw etc.

Table B-8 Electric Powered Rotary Tools, with Impact Option

(BV = Basic Value in RU)

A	B	C
Tool coefficient 5 RU/min	Tool coefficient 7.5 RU/min	Tool coefficient 10 RU/min
–	Power consumption 800 W BV = 11	Power consumption 1350 W BV = 25

These tools are used to drill or cut with or without impacting option.

Examples: Electric hammer drill machine, jack hammers, concrete breakers etc.

Table B-9 Electric Powered Impact Machine without Rotation Option

(BV = Basic Value in RU)

A	B	C
Tool coefficient 5 RU/min	Tool coefficient 7.5 RU/min	Tool coefficient 10 RU/min
–	Power consumption 800 W BV = 11	Power consumption 1350 W BV = 25

These tools are used for hammering, breaking up or deforming without rotation option.

Examples: Building hammer etc.

Table B-10 Electric Powered Grinding/Slitting Machine Tools

(BV = Basic Value in RU)

A	B	C
Tool coefficient 5 RU/min	Tool coefficient 7.5 RU/min	Tool coefficient 10 RU/min
–	Power consumption 800 W BV = 14	Power consumption 2300 W and with: Abrasive disc BV = 25 Or Diamond disc BV = 35

These tools are used for cutting, grinding or abrasion.

Examples: Electric disc cutter machine.

Table B-11 Oxy-acetylene Torch

(BV = Basic Value in RU)

A	B	C
Tool coefficient 5 RU/min	Tool coefficient 7.5 RU/min	Tool coefficient 10 RU/min
–	Oxy-acetylene torch lance length 1300 mm, Nozzle diameter 2.8 mm BV = 14 (Recommended oxygen consumption: 50 lit/minute ± 10 percent)	Oxy-acetylene torch lance length 1300 mm, Nozzle diameter 3.2 mm BV = 28 (Recommended oxygen consumption: 250 lit/minute ± 10 percent)

These tools are used for cutting, melting, blowing metal.

Examples: Oxy-acetylene gas cutter.

Table B-12 Accessories for Tools of Table B-1 up to B-11

(BV = Basic Value in RU)

A	B	C
HHS-drills BV = 1	HHS/Carbide tipped drills BV = 2	HHS/Carbide tipped drills BV = 3
Saw blade BV = 1	Saw blade BV = 2	Chisel/bit BV = 4
Chisel BV = 1	Chisel/bit BV = 3	Disc diameter 230 mm, thickness 2 mm BV = 5
Wedge BV = 1	Disc diameter 125 mm, thickness 2 mm BV = 4	Diamond disc diameter 230 mm BV = 14
Punch BV = 1	Nozzle BV = 4	Nozzle BV = 5

HSS = High speed steel.

These are consumable and replaceable accessories, used with tools of Table B-1 up to B-11.

Their use is represented by a basic value.

ANNEX C

(*Clause* 5)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
277 : 2013	Galvanized steel sheets (plain and corrugated)
513 (Part 1) : 2016	Cold rolled low carbon steel sheets and strips: Part 1 Cold forming and drawing purpose (*sixth revision*)
513 (Part 2) : 2016	Cold rolled low carbon steel sheets and strips: Part 2 High tensile and multi-phase steel (*sixth revision*)
1079 : 2017	Hot rolled carbon steel sheets, plates and strips — Specification (*seventh revision*)
1875 : 1992	Carbon steel billets, blooms, slabs and bars for forging (*fifth revision*)
2062 : 2011	Steel for general structural purposes — Specification (*seventh revision*)
5986 : 2017	Hot rolled steel sheets, plates and strips for forming and flanging purpose — Specification (*fourth revision*)
6911 : 2017	Stainless steel plate, sheet and strip — Specification
5522 : 2014	Stainless steel plate, sheet and strip for utensils — Specification
6603 : 2001	Stainless steel bars and flats — Specification

ANNEX D

(*Foreword*)

COMMITTEE COMPOSITION

Security Equipments Sectional Committee, MED 24

Organization	*Representative(s)*
Reserve Bank of India, Mumbai	Shri D. Kumar Raghu (***Chairman***)
Bank of India, Mumbai	Capt Akhilesh Kumar
Central Building Research Institute, Roorkee	Dr Suvir Singh Dr Rajiv Kumar (*Alternate*)
Central Bank of India, Mumbai	Col A. K. Jha
EMTAC Laboratories Private Limited, Hyderabad	Shri Supriyo Ganguly
Godrej & Boyce Manufacturing Company Limited, Mumbai	Shri Prashant C. Shri Pushkar Gokhale (*Alternate*)
Guardwel Industries Private Limited, Mumbai	Shri John Dmello Shri Leon George (*Alternate*)
Gunnebo India Private Limited, Thane, Mumbai	Shri R. Srinivasan Shri Ashutosh Satpute (*Alternate*)
Indian Banks Association, Mumbai	Shri K. Unnikrishnan
Indian Overseas Bank, Chennai	Capt P. Venkatesan
Indian Institute of Technology, Bombay, Mumbai	Prof P. P. Date
Insurance Regulatory and Development Authority, New Delhi	Shri T. S. Naik
Methodox Systems Limited, Indore	Shri S. K. Singh Shri Karn Katariya (*Alternate*)
NCR Corporation India Private Limited, Mumbai	Shri Ashok Shankar
Punjab National Bank, New Delhi	Capt B. K. Tyagi Shri Arun Kumar (*Alternate*)
Safeage Security Products Private Limited, Mumbai	Shri Rajan Vasanoi Shri Naresh Panchal (*Alternate*)
Sherni Locks Manufactures Private Limited, Pune	Shri Farokh Kutar Shrimati Arti Gupta (*Alternate*)
Shriram Institute for Industrial Research, Delhi	Dr Tarsem Singh Sian
State Bank of India, Mumbai	Capt Arun Thakur Capt Sushil Singh (*Alternate*)
Tata Consultancy Services Limited, Mumbai	Shri Ajit Menon Shri R. K. Raghavan (*Alternate*)
Union Bank of India, Mumbai	Brig Ashutosh Sirothia
Voluntary Organization in Interest of Consumer Edcuation, New Delhi	Shri M. A. U. Khan
In Personal Capacity (*Plot No. 41, Block No. 5, Mehta Cottage, Dr Raut Road, Shivaji Park, Dadar, Mumbai*)	Shri Ajit G. Naravane
BIS Directorate General	Shri Rajneesh Khosla, Scientist 'E' and Head (MED) [Representing Director General (*Ex-officio*)]

Member Secretary

Ms Khashboo Kumari
Scientist 'C' (MED), BIS

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 2016 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc No.: MED 24 (14253).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.gov.in

Regional Offices: *Telephones*

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg
NEW DELHI 110002
{ 2323 7617
{ 2323 3841

Eastern : 1/14 C.I.T. Scheme VII M, V.I.P. Road, Kankurgachi
KOLKATA 700054
{ 2337 8499, 2337 8561
{ 2337 8626, 2337 9120

Northern : Plot No. 4-A, Sector 27-B, Madhya Marg
CHANDIGARH 160019
{ 265 0206
{ 265 0290

Southern : C.I.T. Campus, IV Cross Road, CHENNAI 600113
{ 2254 1216, 2254 1442
{ 2254 2519, 2254 2315

Western : Manakalaya, E9 MIDC, Marol, Andheri (East)
MUMBAI 400093
{ 2832 9295, 2832 7858
{ 2832 7891, 2832 7892

Branches : AHMEDABAD. BENGALURU. BHOPAL. BHUBANESHWAR. COIMBATORE. DEHRADUN. DURGAPUR. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. JAMMU. JAMSHEDPUR. KOCHI. LUCKNOW. NAGPUR. PARWANOO. PATNA. PUNE. RAIPUR. RAJKOT. VISAKHAPATNAM.

Published by BIS, New Delhi